

Application No.: 10/780,849
Amendment under 37 CFR 1.111
Reply to Office Action dated April 8, 2005
August 8, 2005

AMENDMENTS TO THE CLAIMS

Please substitute the following claims for the pending claims with the same numbers respectively:

Claim 1 (Currently amended): A nitride semiconductor device comprising:

a semiconductor layer;

a first electrode for establishing an ohmic contact disposed on the semiconductor layer, the first electrode including an upper layer and a lower layer and being subjected to heat treatment; and

a second electrode formed on the first electrode, the second electrode having a different shape from a shape of the first electrode, the second electrode further including an upper layer and a lower layer,

wherein the upper layer of the first electrode consists of an elemental metal, a compound or alloy including at least one of Pt, Pd, Rh, Ir, Ru and Os and the lower layer of the second electrode comprise an element of the platinum group consists of an elemental metal, a compound or alloy including at least one of Pt, Pd, Rh, Ir, Ru and Os and form a joint region joining the first electrode to the second electrode and at least one of materials forming the upper

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layer of the first electrode and at least one of materials forming
the lower layer of the second electrode are the same.

Claim 2 (Original): A nitride semiconductor device according to claim 1, wherein the lower layer of the first electrode comprises a material which is alloyable by heat treatment.

Claim 3 (Currently amended): A nitride semiconductor device according to claim 1, wherein the upper layer of the first electrode comprises ~~an~~ the elemental metal of ~~the platinum group or an alloyed~~ material essentially composed of Pt, Pd, Rh, Ir, Ru, and Os or the alloy includes homologous elements ~~in the platinum group~~.

Claim 4 (Currently amended): A nitride semiconductor device according to claim 1, wherein the lower layer of the second electrode comprises ~~an~~ the elemental metal of ~~the platinum group or an~~ the alloy including at least one of ~~the platinum group metals~~ Pt, Pd, Rh, Ir, Ru, and Os.

Claim 5 (Original): A nitride semiconductor device according to claim 1, wherein the upper layer of the first electrode comprises Pt.

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Claim 6 (Original): A nitride semiconductor device according to claim 1, wherein the lower layer of the second electrode comprises Pt.

Claim 7 (Currently amended): A nitride semiconductor device according to claim 1, wherein the surface of the semiconductor layer on which the first electrode is formed comprises an electrode formation region and an insulating layer formation region and the second electrode everlies is disposed on the electrode formation region and the insulation insulating layer formation region.

Claim 8 (Original): A nitride semiconductor device according to claim 7, wherein the insulating layer formation region comprises a plurality of areas arranged on both sides of the electrode formation region in a stripe, or a plurality of areas separated by the electrode formation region.

Claim 9 (Original): A nitride semiconductor device according to claim 1, wherein the semiconductor layer has a ridge and the first electrode is disposed on the upper surface of the ridge so that the nitride semiconductor device functions as a laser device.

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Claim 10 (Original): A nitride semiconductor device according to claim 9, further comprising a first insulating layer extending from the side surfaces of the ridge to the upper surface of the semiconductor layer and a second insulating layer extending from the upper surface of the first insulating layer to the side surfaces of the semiconductor layer, the second insulating layer being separate from the first electrode.

Claim 11 (Original): A nitride semiconductor device according to claim 10, further comprising an adhesion layer comprising a single-layer film or a multilayer film, wherein said adhesion layer is disposed on the surface of at least one of the first insulating layer and the second insulating layer.

Claim 12 (Currently amended): A nitride semiconductor device according to claim 11, wherein the upper surface of the adhesion layer ~~contains an element of the platinum group comprises an~~ elemental metal, a compound or alloy including at least one of Pt, Pd, Rh, Ir, Ru and Os.

Claim 13 (Currently amended): A nitride semiconductor device according to claim 11, wherein a material forming the upper surface

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of the adhesion layer ~~comprises the same and a material as forming~~
~~the upper layer of the first electrode are the same.~~

Claim 14 (Original): A nitride semiconductor device according to claim 11, wherein the upper surface of the adhesion layer comprises Pt.

Claim 15 (Original): A nitride semiconductor device according to claim 11, wherein the adhesion layer is in contact with one of the upper surface and the lower surface of the first electrode.

Claims 16-30 (Cancelled):

Claim 31 (Currently amended): A nitride semiconductor device comprising:
a semiconductor layer;
a first electrode for establishing an ohmic contact disposed on the semiconductor layer;
a second electrode on the first electrode, having a different shape from the shape of the first electrode; and
an insulating layer on the surface of the semiconductor layer,

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wherein the surface of the semiconductor layer on which the first electrode is formed comprises an electrode formation region and an insulation insulating layer formation region, and the second electrode overlies is disposed on the electrode formation region and the insulating layer formation region;

wherein the first electrode includes an upper layer and a lower layer, and the second electrode further includes an upper layer and a lower layer, wherein the upper layer of the first electrode and the lower layer of the second electrode each consist of an elemental metal, a compound or alloy including at least one of Pt, Pd, Rh, Ir, Ru and Os and form a joint region joining the first electrode to the second electrode.

Claim 32 (Original): A nitride semiconductor device according to claim 31, wherein the insulating layer formation region comprises a plurality of areas arranged on both sides of the electrode formation region in a stripe, or a plurality of areas separated by the electrode formation region.

Claim 33 (Original): A nitride semiconductor device according to claim 32, wherein the first electrode is disposed on the upper surface of the ridge so that the nitride semiconductor device functions as a laser device.

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Claim 34 (Original): A nitride semiconductor device according to claim 33, wherein the insulating layer includes a first insulating sublayer extending from the side surfaces of the ridge to the upper surface of the semiconductor layer and a second insulating sublayer extending from the upper surface of the first insulating sublayer to the side surfaces of the semiconductor layer, the second insulating sublayer being separate from the first electrode.

Claim 35 (Original): A nitride semiconductor device according to claim 34, further comprising an adhesion layer comprising a single-layer film or a multilayer film, wherein the adhesion layer is disposed on the surface of at least one of the first insulating sublayer and the second insulating sublayer.

Claim 36 (Currently amended): A nitride semiconductor device according to claim 35, wherein the upper surface of the adhesion layer ~~contains an element of the platinum group~~ comprises an elemental metal, a compound or alloy including at least one of Pt, Pd, Rh, Ir, Ru and Os.

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Claim 37 (Original): A nitride semiconductor device according to claim 36, wherein the upper surface of the adhesion layer comprises Pt.

Claim 38 (Original): A nitride semiconductor device according to claim 31, wherein the semiconductor layer has a ridge and the first electrode is disposed on the upper surface of the ridge so that the nitride semiconductor device functions as a laser device.

Claim 39 (Original): A nitride semiconductor device according to claim 38, wherein the insulating layer includes a first insulating sublayer extending from the side surfaces of the ridge to the upper surface of the semiconductor layer and a second insulating sublayer extending from the upper surface of the first insulating sublayer to the side surfaces of the semiconductor layer, the second insulating sublayer being separate from the first electrode.

Claim 40 (Original): A nitride semiconductor device according to claim 39, further comprising an adhesion layer comprising a single-layer film or a multilayer film, wherein the adhesion layer is disposed on the surface of at least one of the first insulating sublayer and the second insulating sublayer.

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Claim 41 (Currently amended): A nitride semiconductor device according to claim 40, wherein the upper surface of the adhesion layer ~~contains an element of the platinum group comprises an~~ elemental metal, a compound or alloy including at least one of Pt, Pd, Rh, Ir, Ru and Os.

Claim 42 (Original): A nitride semiconductor device according to claim 41, wherein the upper surface of the adhesion layer comprises Pt.

Please add the following new claims 43-45 as follows:

Claim 43 (New): A nitride semiconductor device according to claim 1, wherein the lower layer of the first electrode has at least one element selected from the group consisting of Ni, Co, Fe, Cu, Au, and Al and their oxides and nitrides.

Claim 44 (New): A nitride semiconductor device according to claim 31, wherein the lower layer of the first electrode has at least one element selected from the group consisting of Ni, Co, Fe, Cu, Au, and Al and their oxides and nitrides.

Claim 45 (New): A nitride semiconductor device comprising:

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a semiconductor layer;

a first electrode for establishing an ohmic contact disposed on the semiconductor layer;

a second electrode on the first electrode, having a different shape from the shape of the first electrode; and

an insulating layer on the surface of the semiconductor layer, wherein the insulating layer is disposed between a) the first electrode and the second electrode and b) the semiconductor layer; and

wherein the surface of the semiconductor layer on which the first electrode is formed comprises an electrode formation region and an insulating layer formation region, and the second electrode is disposed on the electrode formation region and the insulating layer formation region;

wherein the first electrode includes an upper layer and a lower layer, and the second electrode further includes an upper layer and a lower layer, wherein the upper layer of the first electrode and the lower layer of the second electrode each comprise an elemental metal, a compound or alloy including at least one of Pt, Pd, Rh, Ir, Ru and Os and form a joint region joining the first electrode to the second electrode.